

### AMENDMENTS TO THE CLAIMS

Please amend claims 1-4, 7, 8, 10, 13, 16, 18, 19, and 22, and cancel claim 9 as set forth below.

The current listing of claims replaces all prior listings.

1. (Currently Amended) An apparatus comprising:
  - a. an analysis chamber containing one or more cantilever structures, wherein each structure comprises one or more covalently attached nucleic acid templates, and wherein the cantilever structures are fabricated to respond to a mass dependent property change, deflection, or resonant frequency shift of the cantilever structures produced by changes in mass of the attached templates;
  - b. one or more reagent reservoirs in fluid communication with the analysis chamber;
  - c. a detection unit operably coupled to the cantilever structures; and
  - d. a data processing and control unit operably coupled to the chamber, one or more reservoirs, and the detection unit.
2. (Currently Amended) The apparatus of claim 1, wherein the further comprising one or more nucleic acid[s] templates attached to the structures are about 10 to about 100,000 nucleotides in length.
3. (Currently Amended) The apparatus of claim 2, further comprising one or more polymerases in the analysis chamber which incorporate one or more DNA or RNA precursors in positions complementary to one or more nucleotides comprising the attached templates.
4. (Currently Amended) The apparatus of claim [1]3, wherein the one or more DNA or RNA precursors is mass labeled ~~wherein the structures are cantilevers.~~
5. (Original) The apparatus of claim 1, wherein the detection unit comprises a position sensitive photodetector, a piezoelectric detector or a piezoresistor.

6. (Original) The apparatus of claim 1, wherein the detection unit comprises a laser.
7. (Currently Amended) The apparatus of claim [2]4, [said] wherein the detection unit [to] detects a mass property change of ~~changes in mass of the nucleic acids attached to said the~~ structures, deflection of the structures, or resonant frequency shift of ~~and/or the surface stress of said structures produced by the complementary mass labeled nucleotides.~~
8. (Currently Amended) An apparatus comprising:
  - a) an analysis chamber containing at least one cantilever;
  - b) one or more nucleic acid templates ~~molecules~~ covalently attached to the at least one cantilever, wherein the at least one cantilever is fabricated to respond to deflection and/or resonant frequency shift of the cantilever produced by changes in mass of the attached templates;
  - c) a detection unit operably coupled to the at least one cantilever to detect deflection of the at least one cantilever; and
  - d) a data processing unit and control unit operably coupled to the chamber and the detection unit.
9. (Canceled)
10. (Currently Amended) The apparatus of claim [9]8, wherein the ~~information~~ data processing and control unit ~~system~~ is a computer.
11. (Original) The apparatus of claim 8, wherein the detection unit comprises a laser and a position sensitive photo detector.
12. (Original) The apparatus of claim 8, wherein the detection unit comprises a piezoelectric detector, a piezoresistive detector or a piezomagnetic detector.

13. (Currently Amended) The apparatus of claim 8, wherein the one or more nucleic acid[s] ~~templates molecules comprise a template from~~ are about 10 to approximately 100,000 nucleotides in length.

14. (Original) The apparatus of claim 8, further comprising an array of cantilevers, each associated with the same molecule.

15. (Original) The apparatus of claim 8, further comprising an array of cantilevers, each associated with a different molecule.

16. (Currently Amended) An apparatus comprising:

- a) an analysis chamber containing at least one cantilever;
- b) one or more nucleic acid templates molecules covalently attached to the at least one cantilever, wherein the at least one cantilever is fabricated to respond to deflection and/or resonant frequency shift of the cantilever produced by changes in mass of the attached templates;
- c) a piezoresistive resistor embedded at the fixed end of at least one cantilever;
- d) a detection unit operably coupled to the piezoresistive resistor to detect deflection of the at least one cantilever; and
- e) a data processing and control unit operably coupled to the chamber and the detection unit.

17. (Original) The apparatus of claim 16, further comprising a resistance measuring device.

18. (Currently Amended) The apparatus of claim 16, wherein the one or more nucleic acid ~~templates molecules comprise a template from~~ are about 10 to approximately 100,000 nucleotides in length.

19. (Currently Amended) An apparatus comprising:

- a) an analysis chamber containing at least on cantilever;
- b) the at least one cantilever coated with a substance on at least one surface;

c) [one] two or more nucleic acid[s] templates ~~molecules associated with~~ covalently coupled to the coated surface of the at least one cantilever in a selected pattern, wherein the at least one cantilever is fabricated to respond to a mass dependent property change, deflection, or resonant frequency shift of the cantilever structures produced by changes in mass of the coupled templates;

d) one or more polymerases in the analysis chamber;

[d]e) a detection unit operably coupled to the at least one cantilever to detect deflection of the at least one cantilever; and

[e]f) a data processing and control unit operably coupled to the chamber and the detection unit.

20. (Original) The apparatus of claim 19, wherein the substance comprises an alloy.

21. (Original) The apparatus of claim 20, wherein the alloy is gold.

22. (Currently Amended) The apparatus of claim 18, wherein the nucleic acid[s] templates ~~molecules~~ are coupled ~~anchored~~ to the cantilever through a thiol group.

In re Application of:

Sundararajan et al.

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PATENT

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**AMENDMENTS TO THE TITLE**

Please amend the Title to read as follows:

AN APPARATUS FOR NUCLEIC ACID ANALYSIS